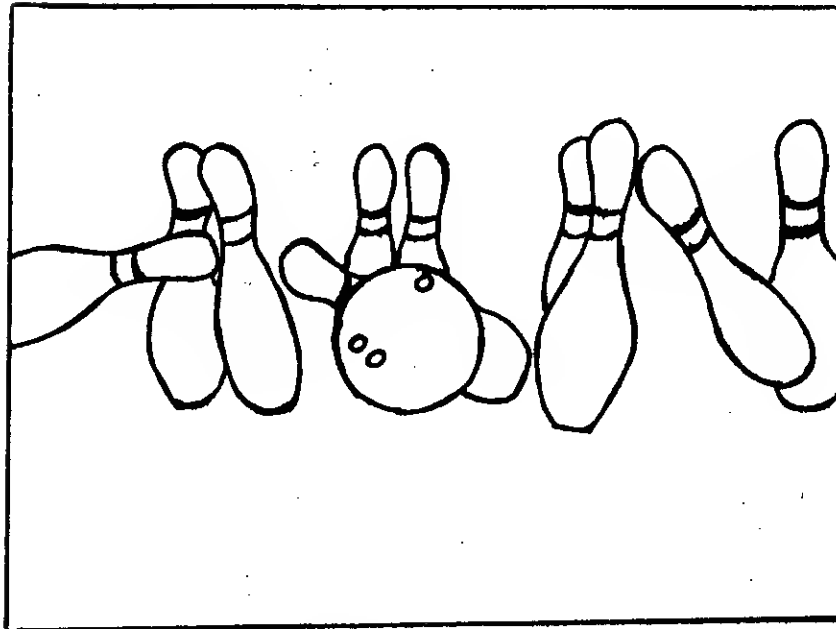


FOR TEXAS INSTRUMENTS 99/4 HOME COMPUTER

NATURAL SOFTWARE PRESENTS

3D BOWLING



written by TIN FLANAGAN

3D BOWLING INSTRUCTIONS

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REGARDING THE PROGRAMS	

3D BOWLING--QUICK REFERENCE

Player Names--Abbreviated nickname or initials.

Ball Hardness--0 to 9. 0=HARD=DELAYED,CONSISTENT HOOK. 9=SOFT=EARLY HOOK.

Dil --0 to 9. 0=DRY LANES 9=WET,SLIPPERY LANE.

Dil Evaporation--0 to 9. 0=DIL DOESN'T CHANGE. 9=RAPID EVAPORATION.

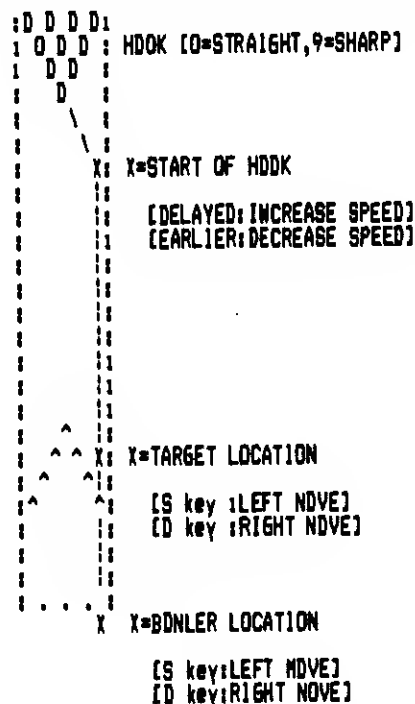
Move Target Marker---S(left) & D(right) keys.

Move Bowler-----S(left) & D(right) keys.

Spin---0=NO SPIN=STRAIGHT BALL. 9=MAXIMUM SPIN=SHARP HOOK.

Speed--0=SLOWEST SPEED=EARLIEST HOOK. 9=MAXIMUM SPEED =MAX. DELAY OF HOOK.

ROLL BALL - PRESS ENTER - TIMING IMPORTANT
Game Restart-----R key to restart whole program after 10th frame.



NOTE: THE PROGRAM WILL ALWAYS RESET ALL VALUES AND POSITIONS TO THE VALUES USED ON THE PREVIOUS FIRST BALL.

WHEN CHANGING A VALUE OR POSITION PRESS ENTER TO "LOCK IN" THE DESIRED SETTING.

- 1) Insert NATURAL SOFTWARE 3D BOWLING diskette into drive #1.
- 2) Turn on power to disk drive, expansion box and console as appropriate.
- 3) Select Extended Basic from the title screen menu.
- 4) Program will automatically load in.
- 5) When the program responds with the question about number of players proceed to the "Playing the Game" section of this manual.

3D BOWLING-LOADING PROGRAM BY CASSETTE

- 1) Insert NATURAL SOFTWARE 3D BOWLING cassette into cassette player #1.
- 2) Turn on tape player and console power and select Extended Basic.
- 3) Type on OLD CSI and follow the computer's directions.
- 4) When the program is loaded then type RUN.
- 5) The NATURAL SOFTWARE title screen will appear followed by a statement "NOW LOADING DATA". DO NOT REWIND the tape as instructed because additional data follows the program on the tape.
- 6) This additional minute loads in 1200 pin actions. You will then be asked a question about the number of players. Proceed to the "Playing the Game" section of this manual.

3D BOWLING DEFINITIONS/SPEECH VOCABULARY.

- Angle--A combination of bowler positioning and lane TARGET forming a LINE or trajectory to the HEAD PIN or POCKET.
- Arrow--A black triangular marker on the lane to aid the bowler in aiming the ball in the proper direction. See one "playing the third arrow" is aiming at the third arrow from the right gutter or edge of the lane.
- Ball Hardness--Bowling balls vary in surface hardness with soft balls tending to "grab" the lane better and hook earlier or sharper.
- Hook--A curving action of the ball dependent upon lane conditions, spin, speed and ball surface hardness.
- Lane--A wooden surface (alley) on which the pins are set and the ball is rolled. It is 60 feet to the HEAD PIN and is approximately 40 1/2 boards wide. Our 3D LANE is 40 pixels wide at the the pins for realistic scale results.

Line--The trajectory or ANGLE used to get the ball to the POCKET (HEAD PIN 1-3 POCKET).

Oil--LANES are coated with an oil or other lubricant to reduce ball/LANE friction and improve the life of the LANE. Increasing the oil however reduces or delays the HOOKING action of the ball.

Pin #'s--
 7 8 9 10
 4 5 6
 2 3
 1

Pocket--The area between the #1 and #3 pins where the potential for a strike is the greatest.

Speed--How fast the ball is rolled. Usually a fast ball will HOOK late or near the pins.

Target--Something (pin, board, or ARRON) that a bowler is aiming at in order to get more consistent and accurate "shots" at the pins.

Turn--SPIN caused by a twisting or turning action of the wrist at the release of the ball.

30 BOWLING -- PLAYING THE GAME

PLAYERS:

of Players--1 or 2 only.

Player Names--Use INITIALS or nicknames such as (ABC, TOM, JOE etc.).

LANE CONDITIONS:

Oil--Ranges from 0 to 9. A 0 means the lanes are extremely dry with no oil. A 9 means that the lanes are extremely oily, wet or slippery.

Oil Evaporation--Ranges from 0 to 9. A 0 evaporation rate means that the oil conditions will remain constant throughout the game. A 9 means an extremely rapid drying out of the lanes. This means that the ball will hook increasingly during the progress of the game.

LANE TARGET:

Oval Marker--On the lane appears an oval movable object called the TARGET. This simulates the board or ARRON that a real bowler would look at throughout the delivery with the intent of achieving greater consistency and accuracy by only having to "hit" a target 15 feet away instead of one 60 feet away. This TARGET is moved with the S (left) and O (right) keys as means of fine tuning the LINE to the POCKET. The ball is always aimed at that target. The program will always reset to the target position used on the previous first ball roll. Press ENTER to lock in the marker location.

MOVING THE BOWLER:

The S(left) & O(right) keys are used to move the bowler to the desired location on the approach. Standing on the right side of the LANE and aiming at a TARGET also on the right is called an outside LINE which usually results in larger sharp breaking hooks. However standing toward the middle or left side of the LANE tends to reduce the hooking action of the ball. The program will always reset to the previous first ball location. Press ENTER to lock in bowler position.

ADJUSTING SPIN AND SPEED:

Spin--Ranges from 0 to 9. A 0 puts no spin on the ball resulting in a straight ball. A 9 puts extreme spin on the ball causing the ball to HOOK extremely sharp. The program is designed to simulate real bowling by selecting from the list of 1200 pin actions the ones that are appropriate for that type of hook. Just as in real bowling a straight ball will get strikes and splits of the "weak" ball type. However, high spin rolls will result in strikes and splits customary to bowlers with extremely powerful hooks. The program will always reset spin to the value you used on the previous first ball roll. Pressing ENTER locks in the spin value.

Speed--Ranges from 0 to 9. A 0 results in the slowest (not visually perceived) speed of the ball. This causes the ball to start hooking at the earliest possible point for those lane conditions. A 9 for speed results in the maximum time delay before the ball will start hooking. The program will always reset speed to the value used on your previous first ball. Pressing ENTER locks in the speed value.

PIN ACTION:

First Ball: Extreme care has been taken to attain about 98% accuracy between 1st ball pin action results in this program to that of real bowling. This was based on 20 years of bowling experience.

Second Ball: The design goal of keeping this program under 14k resulted in a slight compromise in second ball visual effects. However, at least a 90% accuracy rate has been achieved. Only in rare instances is it possible to make a spare in an unrealistic manner. An example of this is the 4-10 which can be made on the right side of the 4 pin. The user, however, can assume that the 4 bounced off the wall and rolled over to the 10.

GAME OBJECTIVE:

The goal of the player is the same as in real bowling. It is to identify what type of lane conditions exist and figure out which combination of ball, spin, speed and angle are required in order to find a "groove" into the strike pocket. This should be done as quickly as possible in order to maximize scores.

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